

QUALITY ASSURANCE THROUGH COMPETENT PEOPLE- A STUDY OF “RASHTRIYA ISPAT NIGHAM LIMITED, VISAKHAPATNAM”

ADDANKI MURALI MOHAN¹ & P. SRINIVASA REDDY²

¹Research Scholar, Department of Management Studies, Vignan's Foundation for Science,
Technology & Research, Guntur, Andrapradesh, India

²Professor, Department of Management Studies, Vignan's Foundation for Science,
Technology & Research, Guntur, Andrapradesh, India

ABSTRACT

The research paper titled “Quality assurance through competent people- A study of RASHTRIYA ISPAT NIGAM LIMITED, VISAKHAPATNAM” a first shorebased Public Sector integrated steel plant in India, is an attempt to identify the attributes of Technical and Behavioral competencies required for consistent performance of producing quality products by the front line officers of Quality Assurance & Technological Development (QA&TD) department of RASHTRIYA ISPAT NIGAM LIMITED, VISAKHAPATNAM. The word ‘competence’ appears to be the quality of being adequately or well-qualified physical and intellectual skills for performing a particular job or role. Competence mapping is one of the most accurate means of identifying the technical and behavioral competencies needed for a particular job of an individual to perform the role efficiently and effectively.

The study uses descriptive research as it aims to evaluate the technical and behavioral competencies possessed by the front line officers of Quality Assurance & Technological Development (QA&TD) department of Rashtriya Ispat Nigam Limited, Visakhapatnam / ‘VIZAG STEEL PLANT’. The research comes up with the results based on statistical tools used for analysis. Cronbach’s Alpha reliability test, t-test, one way ANOVA, Levene’s and Bartlett’s test tools are used in the research. The study has shown that customers are well satisfied with assured quality through competent people marching towards “VIZAG STEEL as PRIDE of STEEL”.

KEYWORDS: Quality Assurance, Competency, Competency Mapping & Human Power

Received: Jan 15, 2018; **Accepted:** Feb 05, 2018; **Published:** Mar 21, 2018; **Paper Id.:** IJMPERDAPR2018123

1. INTRODUCTION

“If you go down to the root of any problem, you shall find HUMAN”....

Peter Drucker.

The statement of Peter Drucker has been ever applied to any situation, it is omnipresent and omnipotent. Human resources are recognized as the most valuable assets for the development of organizations. With the rapid social and technological changes that are occurring, our society is faced with acute human problems never before encountered. So, it clearly indicates that HUMAN POWER plays a very important role and competent employees are vital to the success of any organization.

It was proven and many research studies are concluding that the performance of the organization depends on the performance of the employees working on it. To ensure growth and development of any organization, the

efficiency of people must be augmented in the right perspective. Without human resources, the other resources cannot be operationally effective at all. The original health of the organization is indicated by the human power and its behavior variables, like group loyalty, skill, motivation and capacity for effective interaction, communication and decision making etc.

Competence development needs identification of the competencies required for improvement of an individual or group of people in relation to their job requirements. It consists of breaking a given role or job into its sub-tasks or activities and identifying the competencies (functional and behavioral competencies) needed to perform the job successfully for sustenance.

2. SURVEY OF LITERATURE

Chanakya's Arthashastra was probably the first book on Competency Mapping explained competency mapping models as early as 3000 years ago. It is, perhaps, the oldest management book which is still proving to be an excellent leader for management professionals and practitioners. The book contains competency mapping models, the thesis and theories of human aptitude, intelligence quotient and emotional quotient.

McClelland [1973] pioneered Competency movement during the early days. In his study, he has presented data to show that traditional achievement and intelligence scores may not be able to predict Job Success and it is only the exact competencies required to perform a given job effectively and measuring them using a variety of tests, one can be sure about his profile.

Katz [1994] in his study on Competency Mapping grouped competencies under three categories including Technical, Managerial, and Behavioral (Human).

Gilbert (1996) defines competence as the state of being competent refers to having the ability to consistently produce the results.

Harrison (2000) depicted that learning through training influence the organizational performance by greater employee performance, and is said to be a key factor in the achievement of corporate goals. However, implementing training programs as a solution to covering performance issues such as filling the gap between the standard and the actual performance is an effective way of improving employee performance.

Geroy (2001) showed employee competencies changes through effective training programs. It not only improves the overall performance of the employees to effectively perform the current job, but also enhance the knowledge, skills an attitude of the workers necessary for the future job, thus contributing to superior organizational performance.

Deb (2006) stated that Human Resource Manager has to help all other functions to continuously upgrade their own systems, processes, practices, and skills by providing relevant internal and external training and expertise. He also explained that to keep upgrading the competencies of the human resources functionaries at all levels, in the formulation and implementation of human resources, structures, systems, policies and practices dealing with individuals and collectives, as well as their dynamically updated knowledge of the business environment, others functions challenges and emerging human resources needs.

Seema Sanghi (2007) in her book, "The Handbook of Competency Mapping" focuses on key issues that include understanding and developing competencies, implementing and mapping competencies in an assessment center. It also

reviewed the plethora of application-based experiences and existing models, effectively managing the consequent changes in the organization and integration of the competency framework within the HR system of an organization.

Yuvaraj [2011] has explained the Job Competencies required for working in manufacturing industry professionals are knowledge, ability, and attitude. A gap analysis was also made to a limited extent for the benefit of the company.

Md. Ishtiaq Uddin, [2012] in his study "Competency Mapping: A Tool for HR Excellence" has explained various tools for implementing Competency Model including Job Analysis, Job Description, Job Specification, Competency Matrix, 360 -degree Feedback etc. He is of the view that Competency mapping can also be used for coaching and succession planning of employees.

Solomon [2013] in his study on Competency mapping has tried to explore the level of Competency prevailing among the executives of the public sector. The results of the study show that nearly half of the respondents have a moderate level of managerial HR and general competencies.

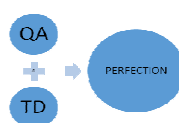
Chouhan, Vikram Singh, (2014), Competency Mapping for Professionals in IT Industry has Competency models are a natural fit for human resources. They are position models at the heart of every competency-based HR application. Thus, competencies and competency models are a viable tool that can be utilized to prepare the current and future workforce and retain skilled incumbent workers to meet the job requirements and other needs of employers. There is a strong and positive relationship between possession of competencies and successful job performance. This can be explained by the fact that HR jobs have a different role to play and each role requires different dimensions of behavior. Thus, competencies and competency models are a viable tool that can be utilized to prepare the current and future workforce and retain skilled incumbent workers to meet the job requirements and other needs of employers.

Jain, V. K., (2015), Competency Mapping in Indian Industries - A Case Study of RXY Laboratories keeps a record of employees' Job Roles and prepares the Job descriptions accordingly. The study was undertaken to analyze employee competencies including Attributes, Skills and Knowledge parameters in detail and do a gap analysis in the actual and desired skills and assess the training needs of the employees. It will help to improve the performance of the employees in general and provide information to the company about the skills they possess which will ensure the development of the organization. Employee Development also focuses on enhancing employee competencies, which help them to cope up with organizational change.

3.0. QUALITY ASSURANCE AND TECHNOLOGY DEVELOPMENT

Quality Assurance is a proactive process aims at preventing the defects and also a set of activities for ensuring quality in the production processes by which quality products are developed.

Technology Development is a continuous process which strives for perfectionism by a practical application of knowledge and use of techniques in developing innovative productive activities.



QA&TD stands for Quality Assurance and Technology Development.

3.1 QUALITY

Quality can be defined in many ways, but

- The totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied need or fitness of the product or services for the use.
- Quality is also defined as inversely proportional to the variability.

3.2 QUALITY ASSURANCE

To plan and systematic actions necessary to provide adequate confidence that a product or service will satisfy the given quality requirements.

In other words, the quality of a product is assured by initiating the control activity right from an input and continued throughout the process till the product is dispatched to the customer for use. To Assure the technology has to be continuously modified or improved depending upon the demands from time to time. This is where the technology development comes into the picture. Development is the continual improvement incidental to the challenges faced to ensure the quality either in input or in the processor in the inspection of the products.

Quality assurance starts right from checking the quality of raw materials for the compliance to the purchase specification and quality of in -process materials for adherence of set norms and finally the checking of the products for meeting the specification or customer requirements.

Quality Assurance at Vizag Steel Plant consists of quality control, Process control, Inspection, Testing, grade declaration and certifying. Quality control deals with testing of raw materials, monitoring process parameters and manifesting semi-finished/ finished products.

Process control monitors the salient process parameters to adherence of the set norms at various stages. Inspection and Testing ensure the quality of the products dispatched to the customers.

Quality Assurance is one of the vital functions of any successful organization in the present scenario of the competitive industrial world. The role of QA&TD department of Vizag Steel Plant is in line with all the above -mentioned dimensions.

4.0 QUALITY ASSURANCE AND TECHNOLOGY DEVELOPMENT of RINL, VSP/ VIZAG STEEL

4.1 SECTIONS OF QA&TD DEPARTMENT

- **CO&CCP LAB**

* Central Laboratory

* Tar Distillation Plant Lab

* MBC Laboratory

* Sample Preparation Station-1

- **IRON LAB**

* Iron Laboratory,

* Raw Material Bins Laboratory

* Sample Preparation Station-3

• **POWER PLANT LAB**

* Thermal Power Plant Laboratory * Chilled Water Treatment Plant

• **STEEL LAB**

* Steel Laboratory *Sample Preparation Station-2

• **ROLLING MILLS LAB**

* Bloom Inspection * Billet Inspection

* Light and Medium Merchant Mill Lab * Wire Rod Mill Express Lab

* Medium Merchant & Structural Mill Inspection * Spark Testing

• **CUSTOMER VALUE CELL (CVC) & CENTRAL LAB**

* Mechanical Testing (for MMSM Product) * Refractory Testing

* Metallography * Non Destructive Testing * Oil & Water Testing

* Wet Analysis *Instrumental Analysis * Environmental Lab

4.2 QA & TD Department Details with JO to E4 Front Level Officers of RINL, VSP/ ‘VIZAG STEEL PLANT’

Department/Section	Equipments	Frontline Officers
i. CO & CCP	UV Spectrophotometer, Coal/ Coke Analyser, Gas/ Liquid Chromatography, CHNS analyzer, CRI/ CSR equipment, Plastometer	20
ii. Iron lab	2 Optical Emission Spectrophotometer, X-RAY Fluorescence Spectrophotometer, RI/ RDI Apparatus	14
iii. Power Plant Lab	Spectrophotometer, Flame Photometer, Turbidity meter, Conductivity meter, PH meter	06
iv. Steel Lab	5 Lab Automation, Optical Emission, Spectrophotometer, X-Ray Fluorescence Spectrophotometer, NO Analyser, C & S Analyser	19
v. Rolling Mills	Universal Testing Machine 20T, 40T, 60T, Upset Testing Machine, Hardness Tester, Spectrometer, coil cutters, Gas cutters etc.,	07
1 BSY		10
2. LMMM		05
3. MMSM		09
4. WRM		
vi. Central Lab	Optical Emission Spectrophotometer, X-Ray Florescence, Spectrophotometer, Ultrasonic thickness gauge, Ultrasonic flaw detector, Magnetic particle tester, Radiation survey meter, Metallurgical microscope, Quantitative metallography, Vitrinite Reflectance measurement, UV Spectrophotometer, Atomic Absorption Spectrophotometer, Oil Testing equipment, Flame Photometry, Total Organic carbon analyzer, Universal Testing Machine 1000KN, 500KN, 50T, 20T; Compression Testing Machine 50T, Rockwell Hardness Tester, Brinell Hardness Tester, Ash Fusion Point tester, High temperature furnace for Refractory tests, Charpy Impact Tester, RUL	03
1. CVC		04
2. Instrument		02
3. MTL		01
4. RTL		13
5. Spark		02
6. NDT		04
7. Met		
8. Analytical		06

	furnace, Shore scleroscope, sample cutters, coil cutters, gas cutters etc.,	
9.ISO & Trg.		01
10.Planning		01
Total		127

4.3 ACTIVITIES

- Testing and Process Control
- Inspection and Certification
- Handling of Customer Complaints
- Product Development
- Pollution control and analytical activity
- Metallurgical failure analysis

Testing

- Incoming raw materials (coal, Iron ore, limestone, dolomite, and Quartzite, Manganese ore, and Ferrous alloys
- Products (Coke, Sinter, Hot metal, Slag, Liquid Steel, Semi-finished Steel Products, Finished Steel Products, Byproducts of Coke Ovens, Gases, Water, oils & lubricants, Refractories, and Effluents)

Process Control

- Monitoring of charge coal blend composition on Coke Oven battery parameters
- Charge calculation and monitoring of operating parameters at Sinter Plant and Blast Furnaces.
- Monitoring of blowing parameters and additions to converter shop, trimming of chemical composition at argon rinsing station and casting parameters at continuous casting machines
- Monitoring of heating regime of reheating furnaces and cooling parameters at rolling mills.

Inspection

- 100% visual inspection of semis like blooms and billets
- Inspection at intermediate stages of production of steel
- On-line inspection and audit checks of a finished product like re-bars, wire rods, angles, channels, flats, beams etc.
- 100% spark testing of all value-added products for segregation of mix-ups

Certification

- Byproducts
Crude tar, PCM, Phenol fraction, Anthracite oil, Pitch, wash oil & Naphthalene
Toluene, LSN, HBF
- Pig iron
- Granulated slag
- Semi- finished products
- Finished products

4.4 Other Activities

Application Engineering: Through marketing department QA&TD department interfaces with the ultimate users of the plant products and extends technical support.

Technology Dissemination: QA&TD department interacts and mediates between various internal customers/ internal suppliers for the overall improvement.

Publication of Technical Journal: QA&TD brings out "VIZAG QUEST" a technical journal every year comprising articles reflecting the issues of Quality & Technology linkage of inputs, production, modifications, and maintenance practices.

Calibration: In- house calibration of all measuring instruments viz: Vernier calipers and Screw gauges, dividers, measuring instruments, mechanical testing equipment are carried out.

5.0 SURVEY OF COMPETENCY FACTORS FOR FRONT LINE OFFICERS OF QA&TD DEPARTMENT

The checklists of competencies required for employees working in various sections as shown above of QA&TD department is a very exhaustive and laborious task. They were finalized by brainstorming and in consultation with all the concerned area officers, a section in charges, nominated coordinators, training coordinators and finally approved by the Head of the Department.

The list of attributes/factors under technical and behavioral competency varies from role to role, cadre to cadre and also section to section, but most common or usual exemplary list of attributes/factors under Technical & Behavioral Competencies of Junior officer (JO) to E-4 grade is sorted out and listed below:

5.1 TECHNICAL COMPETENCIES

Technical competencies can be further divided into 2 sub components:

Job Knowledge

Job knowledge is a very important dimension and deals with a lot of factors like knowledge of production departments, sections, zones and various incoming, immediate and final products. The role of quality and its importance in every activity about different type of samples, parameters, testing procedures and its impact etc.,. It comprises a list of 06

different competencies such as knowledge on equipment, technical details, startup, starting& stopping routines, interlocks, safety, ISO systems, crisis handling etc., covering all the required knowledge to perform the job.

Job Performance Skills

Job performing skills, play a vital role in performing the job and to implement the concept of knowledge gained. It deals with implementing sample collection techniques, analyzing the result of any corrections, calibrations and standardizing various analytical measures and report generations etc. It comprises a list of 06 important job performing skills e.g. ability to function controls, abnormalities, safe working procedures, analyzing and proactive implementation of corrective activities, training subordinates and so on covers skills required for performing the job effectively.

BEHAVIOURAL COMPETENCIES

Leadership

Leadership is both a research area and a practical skill encompassing the ability of an individual or an organization to "lead" or guide other individuals, teams, or entire organizations. It comprises a list of 5 different competencies (organizing, Leading, Motivating, developing and appraising) underneath.

Team Working

Teamwork means that people will try to cooperate, using their individual skills and providing constructive feedback, despite any personal conflict between individuals. It comprises a list of 3 crucial competencies (cooperation, coordination and integration) under it.

Communication Skills

The ability to convey the information to others effectively and efficiently. Good verbal, nonverbal and written *communication skills* help to facilitate the sharing of information between people within a company for its commercial benefit. It comprises of a list of 6 competencies (Verbal, Written, listening, expressing and emotional awareness) under it.

Personal Attributes

An *attribute* is a quality or characteristic of a person and *Attributes* of a person are the characteristics he has that shape his behavior. *Attributes* can be considered positive or negative or can vary depending on the person. It comprises a list of 6 competencies under it. They are Initiative, creativity, positive, customer focus, effective utilization of resources and dedication towards company objectives.

6.0 DATA ANALYSIS AND INTERPRETATION

Cronbach's Alpha	0.76761261
Split-Half (odd-even) Correlation	0.62439828
Spearman-Brown Prophecy	0.76877486

6.1 Analysis and Interpretation of Reliability Test

Cronbach's Alpha	No of Items
0.767	127

Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It

is considered to be a measure of scale reliability. Many methodologists recommend a minimum α coefficient between 0.65 and 0.8 (or higher in many cases); α coefficient that is less than 0.5 are usually unacceptable. In our study, we have acquired Cronbach’s Alpha as 77% (0.7676) of reliability indicates that the result is very positive and so, we can proceed further.

6.2 Analysis and Interpretation of Objective

Objective: - To measure Frontline officer’s technical & behavioral competencies to map their skills physically and intellectually for assuring quality products towards organizational productivity.

6.3 Hypothesis Design of the Study

H0: -There is no significant difference in implementing Technical & Behavioral competencies for assuring quality of the end products.

H1: (CO&CCP Lab)	There is a significant difference in implementing Technical & Behavioral competencies for assuring Quality of CO&CCP products.
H2: (TPP Lab)	There is a significant difference in implementing Technical & Behavioral competencies for acquiring quality thermal power to essential category loads.
H3: (Iron Lab)	There is a significant difference in implementing Technical & Behavioral competencies for production of quality molten Iron for steel making.
H4: (Steel Lab)	There is a significant difference in implementing Technical & Behavioral competencies for producing quality Liquid Steel.
H5: (Rolling Mill Labs)	There is a significant difference in implementing Technical & Behavioral competencies for the production of quality finished products.
H6: (Central Lab)	There is a significant difference in implementing Technical & Behavioral competencies to satisfy the customer needs of end products.

6.4 Statistical Analysis of the Data

Analysis of t-test for paired two sample means for all sections of QA&TD department.

Table 1

Section of Lab	Competence	Skills	Mean	SE	SD	Variance	t	df	t-Sig. (2tailed)	Accepted
1. CO&CCP	Technical	12	3.76	0.134	0.598	0.357	1.405	19	2.093	H0
	Behavioral	24	3.555	0.12	0.535	0.286				H0
2. Power Plant	Technical	15	3.867	0.071	0.175	0.031	-0.59	5	2.57	H0
	Behavioral	24	3.9	0.026	0.063	0.004				H0
3. IRON	Technical	15	3.193	0.09	0.338	0.115	1.07	13	2.16	H0
	Behavioral	19	3.079	0.076	0.283	0.08				H0
4. SMS	Technical	18	3.9	0.088	0.384	0.148	2.07	18	2.101	H0
	Behavioral	19	3.774	0.048	0.21	0.044				H0
5. Rolling Mills	Technical	16	3.735	0.073	0.407	0.166	0.707	30	2.04	H0
	Behavioral	24	3.694	0.081	0.45	0.203				H0
6. Central Lab	Technical	12	3.759	0.082	0.496	0.246	0.042	36	2.208	H0
	Behavioral	24	3.757	0.07	0.429	0.184				H0

Analysis of variance among Competencies of frontline officers for all sections of QA&TD department

Table 2

Competencies of Different Labs		Sum of Square	df	Mean Squares	F	P Value	F-Critical	Result
1.CO&CCP LAB	Between groups	0.42025	1	0.42025	1.3071	0.260072	4.098172	H0 accepted
	Within groups	12.2175	38	0.321513				
	Total	12.63775	39					
2.POWER PLANT LAB	Between	0.003333	1	0.003333	0.192308	0.670325	4.964603	H0 accepted
	Within groups	0.173333	10	0.017333				
	Total	0.176667	11					
3.IRON LAB	Between	0.091429	1	0.091429	0.938522	0.341584	4.225201	H0 accepted
	Within groups	2.532857	26	0.097418				
	Total	2.624286	27					
4.STEEL LAB	Between	0.164474	1	0.164474	1.679104	0.20329	4.113165	H0 accepted
	Within groups	3.526316	36	0.097953				
	Total	3.690789	37					
5.ROLLING MILL LABS	Between	0.027258	1	0.027258	0.148012	0.701803	4.001191	H0 accepted
	Within groups	11.04968	60	0.184161				
	Total	11.07694	61					
6.CENTRAL LAB	Between	0.000135	1	0.000135	0.000629	0.980068	3.973897	H0 accepted
	Within groups	15.48	72	0.215				
	Total	15.48014	73					

df:- degree of freedom, SE:- Standard error, SD:- Standard deviation.

6.5 Interpretation and Statistical Analysis of the Data

1). **Table-1** is the analysis of t-test for paired two samples of Mean's & **Table-2** is the analysis of variance among competency statistics of the frontline officers of QA&TD department working in different sections. Since the significant level of acquired t-stat for CO& CCP frontline officers is 1.405 and is less than the t-significant value 2.093. whereas in ANOVA, F value which is 1.307 is less than the F-critical value 4.098 and p-value (0.260) is also greater than significance level 0.05. So all the combinations are accepted NULL hypothesis. With this, it is clearly showing that there is no significant difference in implementing technical and behavioral competencies by the all officers in CO&CCP section of QA&TD department assuring good quality of input raw material with a clever coal blend composition for coke making. Excellent Coke Oven, gas is produced by Calorimetric Value (CV) of 4200 Kcal/Nm³ values gives a high temperature zone in the Blast furnace for the production of liquid iron.

2). Thermal power plant normally runs with 4 blowers in full load operation to produce 247.5 MW of power for operating essential category loads. These blowers are axial type and are the largest blowers installed in India. Here table1&2 reveals with statistical analysis confirms the approval of null hypothesis (H0) by F value 0.19 which is less than the significant value of 4.96 and with p-value 0.67 at 0.05 level of significance. So it clearly indicates the effective utilization of Boilers which are capable of firing with combinations of fuels like Coal, Mixed gas, Coke oven, gas and Blast furnace gases, oils and producing the rated power.

3). Iron lab is a very important lab and deals with proportion of burden materials, coke consumption and in time

sample preparations for right quality of molten iron from the blast furnace for production of iron pigs and quality steel. Statistics on the tables depict accepting H_0 with F value 0.938 which is less than F-critic 4.225 and t-value 1.07 is less than t-significant value of 2.16 confirms excellent burden material proportioning with quality iron production and rest assured for better Steelmaking.

4). The core of the quality depends on Steel Lab and it plays a vital role for the sustainability of the organization. It deals with charge calculations & corrections, monitoring, blowing parameters at converter shop, trimming of chemical composition at the Argon rinsing station and casting parameters at continuous casting machines for effective control of the quality of the end product (Blooms). Mean scores of competencies are also high with 3.9 for technical competencies and 3.77 in behavioral competencies when compared to other sections. It is clearly visible that F value 1.679 is less than the critical value 4.113 with df (1, 36) at the 0.05 level of significance. So, it clearly indicates there is no significant difference in enforcing Technical & Behavioral competencies for producing quality liquid steel by Steel lab front line officers.

5). Rolling mills' labs will have a wide spread of activities right from the bloom inspection of continuous casting machines of Steel Melting Shop to final certification of finished products. So, 100% visual inspection of semis like blooms & billets, inspection at intermediate stages of production of steel, monitoring of heating regime of heating furnaces and cooling parameters at rolling of products, on line inspection and audit checks of finished product like re-bars, wire rods, angles, channels, flats, beams etc. The total team of rolling mill labs is operating with highly efficient manner is visible with 3.735 and 3.694 mean scores of competencies and it is evident from the study that F value is 0.148 which is less than critical value 4.00 with p-value is 0.70 at 0.05 level of significance.

6). The central Lab is the heart of QA&TD department and deals with a lot of important activities. Out of all, Customer value cell (CVC) plays an important role and exclusively focuses on customer complaints and their needs for improving customer satisfaction and positive relations further. Other sections in central lab are instrument analysis labs, mechanical and refractory testing labs, Non destructive testing, Metallographic labs, analytical labs, ISO, training and planning, etc. As per the statistics t-stat 0.042 is less than significant value 2.028 and P-value (0.98) is more than 0.05 reveals and confirms that there is no significant difference in implementing competencies of all 37 Frontline officers of central lab section of QA&TD department.

6.6 Results of a Test Comparing Variance - Levene and Bartlett Tests

6.6.1 Levene's Test (Mean) / Two-Tailed Test

Statistics of Competencies

Variable	Observations	Obs. With Missing Data	Obs. Without Missing Data	Minimum	Maximum	Mean	Std. Deviation
Technical	127	0	127	2.500	5.000	3.718	0.486
Behavioral	127	0	127	2.400	4.700	3.644	0.453

Levene's Test (Mean) / Two-Tailed Test

F (Observed alue)	2.216
F (Critical value)	3.879
DF1	1
DF2	252
p-value (Two-tailed)	0.138
alpha	0.05

Test Interpretation

H₀: The variances are identical.

H_a: At least one of the variances is different from another.

As the computed p-value is greater than the significance level $\alpha=0.05$, one cannot reject the null hypothesis H₀.

The risk to reject the null hypothesis H₀ while it is true is 13.78%.

6.6.2 Bartlett's Test / Two-Tailed Test

Chi-square (Observed value)	0.617
Chi-square (Critical value)	3.841
DF	1
p-value (Two-tailed)	0.432
alpha	0.05

Test Interpretation

H₀: The variances are identical.

H_a: At least one of the variances is different from another.

As the computed value of 'p' is greater than the significance level $\alpha=0.05$ and Chi-square critical value is also greater than Chi-square observed value then one cannot reject the null hypothesis H₀.

Summary (p-Values)

Levene	Bartlett
0.138	0.432

Levene's & Bartlett's tests are an inferential statistics used to assess the equality of variances for a variable calculated for two or more groups. Some common statistical procedures assume that the variances of the populations from which different samples are drawn are equal. Here in both the tests clearly signifying that the variances are identical and are not different from one another. So, it clearly resolves that there is no significant difference in implementing Technical & Behavioral competencies for assuring the quality of the end products.

Hence, as per the established statistical analysis of all the t-tests in table-1 and Analysis of Variance (ANOVA) of table-2, Levene's test (Mean) / Two-tailed test, Bartlett's test summarizes that there is no significant difference in implementing Technical and Behavioral competencies of all 127 Frontline officers in the range of Junior Officer to Manager level officers of different sections of QA&TD department from RINL, Visakhapatnam.

Finished Products & Applications of RINL, VSP



Product Mix & Applications		
WIRE ROD	Existing	After expansion
	5.5 - 14 mm	Up to 20 mm
ROUNDS	Existing	After expansion
	16 - 80 mm	Up to 20 mm in cold form
REBARS	Existing	After expansion
	8 - 36 mm	Nil
SQUARES	Existing	After expansion
	65 - 90 mm	Nil
STRUCTURALS	Existing	After expansion
	75 - 150 mm	55 - 175 mm

CONCLUSIONS

“If you go down to the root of any achievement, you shall find Human.Human... & again Human”. A Human brain is like a parachute, it works only when it opens. So it clearly indicates that Human Power plays a very important role and competent employees are vital to the success in producing Quality products by any organization. Therefore, for the sustenance of any business to flourish effectively, an appropriate competency mapping framework of the workforce and competent frontline officers are very important and plays a vital role in quality products.

“Quality is Pride of Workmanship”-E. Edwards Deming. It was made true with Rashtriya Ispat Nigam Limited (VIZAG STEEL), that each and every officer at different sections of the QA&TD department with the different skill set for different roles and cadre at various sections are effectively implementing their technical and behavioral competencies for the growth and development of the organization. So, RINL, VSP (VIZAG STEEL) is investing much effort on ‘HUMAN POWER’ their skills, training, development and knowing that their internal competencies are capable to strike an improvement in their growth along with sustenance of the organization. Therefore, it is evident in the research paper that the ‘Human Power’ of RINL, VSP is quality oriented and is the primary wealth of the organization for marching towards “VIZAG STEEL as PRIDE of STEEL”.

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